AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Currently Amended)** An optical waveguide to amplify optical signals in fiber-optic communications, the optical waveguide comprising:

at least one gain portion that provides a gain to one or more wavelengths in an optical signal; and

at least one gain equalization filter portion that is optically coupled to the at least one gain portion, wherein the at least one gain equalization filter portion selectively attenuates the one or more wavelengths such that the gain of each wavelength in the optical signal is substantially equal, wherein a first one of the at least one gain portion is designed to provide a lower-level of amplification than a second one of the at least one gain portion.

2. **(Canceled)**

3. **(Canceled)**

4. **(Original)** The optical waveguide of claim 1, wherein the at least one gain portion and the at least one gain equalization filter portion are disposed in at least one of a single mode fiber, a multimode fiber and a double clad fiber.

5. **(Original)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion comprises a UV written Bragg grating in the optical waveguide.

6. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion comprises a mechanical perturbation of the optical waveguide.

7. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion comprises an electrically induced grating.

8. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion comprises an etched grating.

9. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion further comprises a series of Bragg gratings at different Bragg wavelengths.

10. **(Original)** The optical waveguide of claim 1, wherein the optical waveguide further comprises an inside core surrounded by a cladding, wherein the at least one gain equalization filter portion is formed in at least one of the inside core and the cladding.

11. **(Original)** The optical waveguide of claim 1, further comprising a doped portion that is doped with at least one of Erbium, Yb, Sm and Tm, wherein the doped portion includes at least one of the at least one gain portion and the at least one gain equalization filter portion.

12. **(Original)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion includes a plurality of discrete segments.

13. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion includes a plurality of Gaussian shaped filters.

14. **(Canceled)**

15. **(Original)** The optical waveguide of claim 1 wherein the at least one gain equalization filter portion selectively attenuates the one or more wavelengths such the gain of each wavelength in the optical signal is within 2dB of each other wavelength in the optical signal.

16. **(Canceled)**

17. **(Canceled)**

18. **(Canceled)**

19. **(Canceled)**

20. **(Canceled)**

21. **(Canceled)**

22. **(Canceled)**

23. **(Canceled)**

24. **(Canceled)**

25. **(Canceled)**

26. **(Canceled)**

27. **(Canceled)**

28. **(Canceled)**

29. **(Canceled)**

30. **(Canceled)**

31. **(Canceled)**

32. **(Canceled)**

33. **(Canceled)**

34. **(Canceled)**

35. **(Canceled)**

36. **(Canceled)**

37. **(Canceled)**

38. **(New)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion is configured to filter input signals having a wavelength between 1530 nanometers and 1562 nanometers.

39. **(New)** The optical waveguide of claim 1, wherein the first gain portion and the second gain portion are on opposite sides of on of the at least one gain equalization filter portion.

40. **(New)** The optical waveguide of claim 1, wherein the second gain section has a longer length than the first gain section.

41. **(New)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion is configured to pre-compensate the optical signal for gain non-uniformities before receiving gain within the optical waveguide.

42. **(New)** The optical waveguide of claim 1, further comprising a doped portion that is doped with at least one of Sm and Tm, wherein the doped portion includes at least one of the at least one gain portion and the at least one gain equalization filter portion.

43. **(New)** An optical waveguide for amplifying optical signals comprising:

at least one gain portion that provides a gain to the optical signal; and

at least one gain equalization filter portion that is optically coupled to the at least one gain portion, wherein the at least one gain equalization filter portion selectively attenuates the one or more wavelengths such that the gain of each wavelength in the optical signal is substantially equal, wherein the at least one gain equalization filter portion is configured to pre-compensate the optical signal for gain non-uniformities before receiving gain from any source within the optical waveguide.

44. **(New)** The optical waveguide of claim 43, wherein the at least one gain equalization filter portion is configured to filter input signals having a wavelength between 1530 nanometers and 1562 nanometers.

45. **(New)** The optical waveguide of claim 43, further comprising a doped portion that is doped with at least one of Sm and Tm, wherein the doped portion includes at least one of the at least one gain portion and the at least one gain equalization filter portion.

46. **(New)** The optical waveguide of claim 43, wherein the optical waveguide is configured to amplify 40 channels.